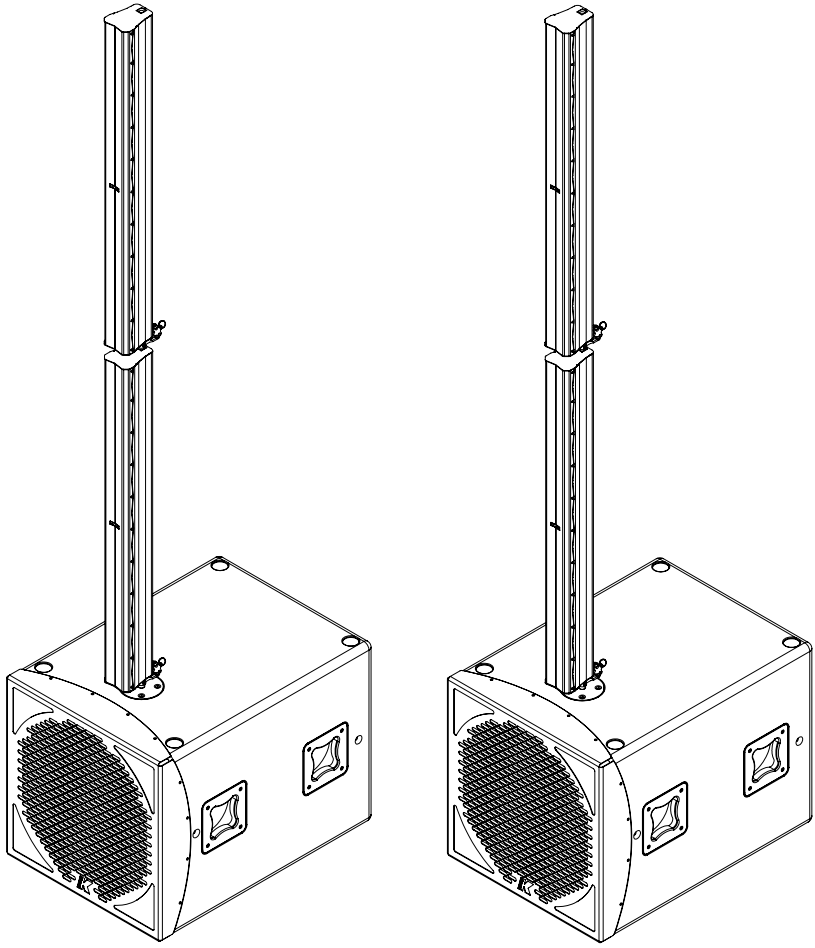
KR400S

USER MANUAL - *english version*



PRELIMINARY

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SYMBOLS

K-array declares that this device is in compliance with the applicable CE standards and regulations. Before putting the device into operation, please observe the respective country-specific regulations!

WEEE

Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling centre for such equipment.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual!

Warning! Dangerous voltages: RISK of electric shock.

This symbol alerts the user to the presence of recommendations about product's use and maintenance.

RoHS COMPLIANT 2002 / 95 / EC

This device complies with Restriction of Hazardous Substances Directive.

1. INTRODUCTION (KL21ma and the KR400S system)

The KR400S is a high performance ultra-slim powered two way system designed for small to medium wavefront systems, in both mobile and installed applications.
The KR400S includes two KR400 satellites and 2 KL21ma powered subwoofers.

The KL21ma features a 2500 watt 21” drive unit with neodymium magnet structure and suspension engineered for maximum linear excursion. Its ultra-light reflex cabinet is fitted with four pocket handles and one 35mm pole mounting point for easy installation of the satellite speakers.

The KR400S features a line array of 24 x 3” high efficiency neodymium magnet drivers enclosed in an ultra-strong chassis, to ensure high resistance and durability in the most demanding working conditions.
Thanks to its true line array technologies and powerful DSP system, the KR400S achieves outstanding power and coherence throughout the intended coverage allowing a wide dynamic range and faithful sound reproduction.

All the components are designed by the K-array R&D department and are custom made and tested by the K-array quality control system.

2. APPLICATIONS

- Theatrical sound reinforcement
- Concert halls, clubs, houses of worship
- Portable and installed audio-visual systems
- Cinema and special effects

3. KEY FEATURES

- Unique performance-to-size ratio
- High power 132dB continuous, 138dB peak
- Fitted with integral handles
- Line array emission wavefront
- Integrated mounting system
- Full Aluminum ultra strong frame
- DSP on board with 16 dedicated presets
- Remote PC control software (RS485)
- Ultra fast set-up and dismantling system

4. UNPACKING

Each K-array loudspeaker is built to the highest standard and thoroughly inspected before leaving the factory. Carefully inspect the shipping carton, then examine and test your new loudspeaker. If you find any damage, immediately notify the shipping company. Only the consignee may institute a claim procedure regarding the system's electronic equipment.

5. WARRANTY

K-array systems are warranted against manufacturing defects in materials or craftsmanship over a period of 2 years from the date of original purchase. During the warranty period K-array will, at its discretion, either repair or replace products which prove to be defective provided that the product is returned in its original packaging, shipping prepaid, to an authorized K-array service agent or distributor. K-array cannot be held responsible for defects caused by unauthorized modifications, improper use, negligence, exposure to inclement weather conditions, acts of God or accidents, or any use of this product that is not in accordance with the instructions provided by K-array. K-array is not liable for consequential damages. This warranty is exclusive and no other warranty is expressed or implied. This warranty does not affect your statutory rights.

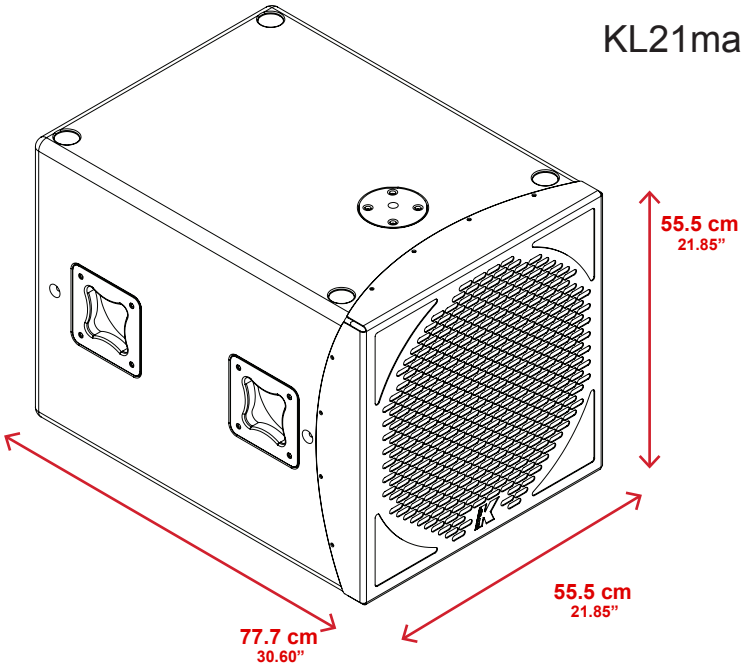
6. SAFETY

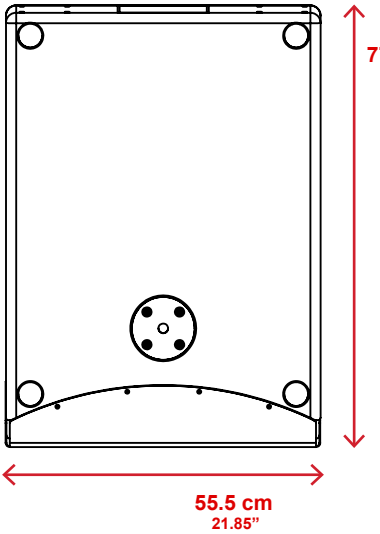
WARNING

- It is important that loudspeaker systems are used in a safe manner.
- Professional loudspeakers are capable of producing extremely high sound levels and should be used with care. Hearing loss is cumulative and can result from levels above 90dB if people are exposed for an extended period.
- Never stand close to loudspeakers driven at high volume.
- Suspending the system should only be done by qualified personnel following safe rigging practices. Secure fixings to the building structure are vital. Seek help from architects, structural engineers or other specialists if in any doubt.
- Do not operate the speaker for an extended period of time with sound distortion. This is an indication of malfunction, which in turn can generate heat and result in a fire.
- Only connect the power supply to an appropriate power adapter.
- Do not install the speaker in wet or humid locations without using weather protection.
- Do not allow water or any foreign object to get inside the speaker. Do not put objects containing liquid on, or near, the unit.
- To reduce the risk of overheating the amplifier, avoid exposing it to direct sunlight. Do not install the unit near heat emitting appliances, such as a room heater or stove.
- No naked flame sources such as lighted candles should be placed near the device.
- The speaker should be placed so that its location does not interfere with its proper cooling.
- Do not attempt to disassemble the unit. The unit contains no user-serviceable parts. Repairs should only be performed by factory trained service personnel.
- Be sure that the adapter has the correct voltage value.

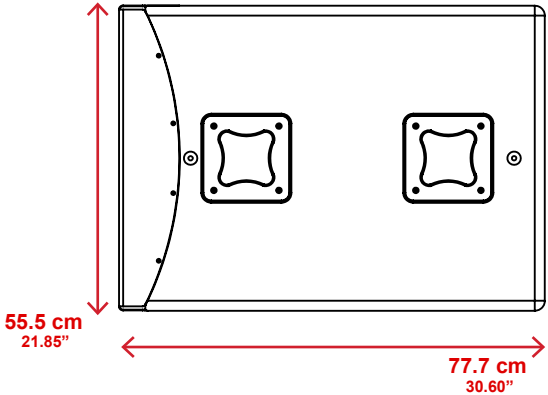
7. PHYSICAL

KL21ma

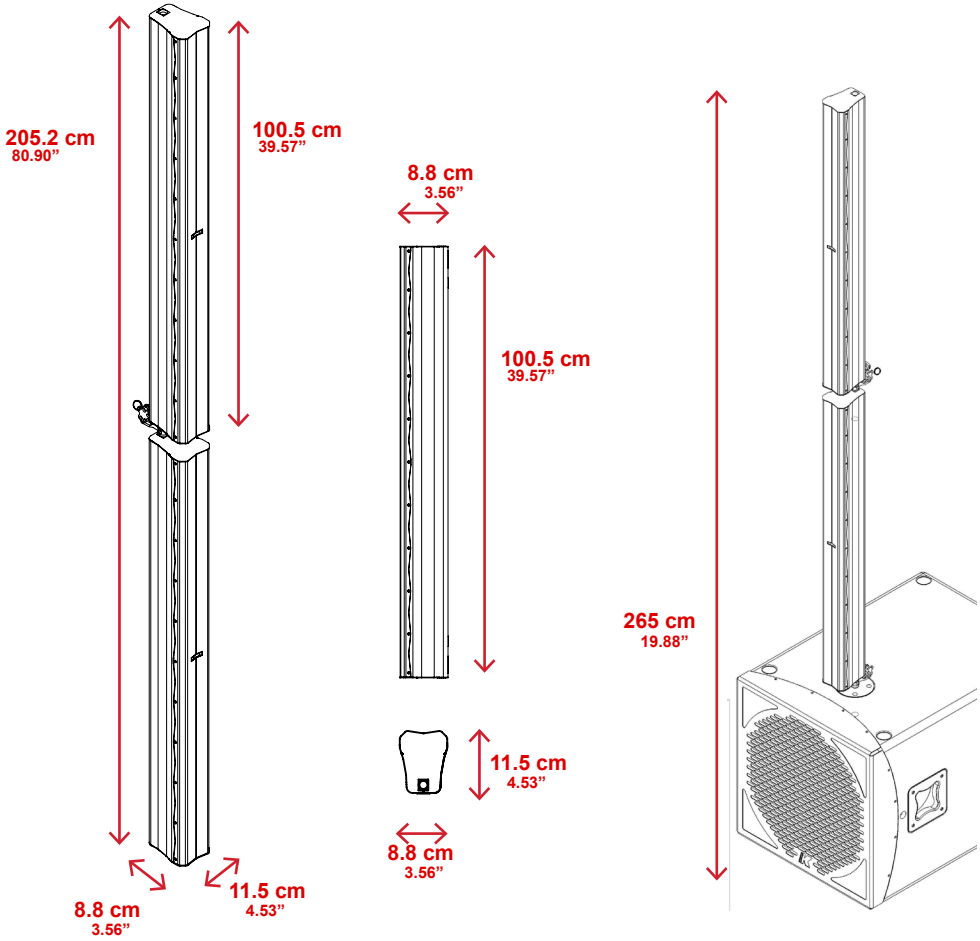




weight: 39 kg (86 lbs)



KR400



weight: 2 X 9 kg (2 x 19.84 lbs)

weight: 57 kg (152.66 lbs)

8. AMPLIFIER

8.1 AC POWER CONNECTOR

The amplifier module and the rest of the audio equipment connected to it (mixing consoles, processors, etc.) must be connected to the AC power distribution in a proper way, preserving AC line polarity and connecting earth ground such that all grounding points are connected to a single node or common point using the same cable gauge as the neutral and line(s) cables. Bad grounding connections between speakers and the rest of the audio system may produce noise, hum and/or serious damage to the input/output stages in the system's electronic equipment.

Before applying AC to any K-array self-powered speaker, be sure that the voltage potential difference between neutral and earth ground is less than 5 VAC.

8.2 VOLTAGE REQUIREMENT

KL21ma operates safely and without audio discontinuity if the AC voltage stays within 85 and 270V, at 50 or 60 Hz.
The device is set by default to be connected to 230V AC Power.
Verify that your mains connection is capable to satisfies the power ratings of the device.

CAUTION

Connecting the system to an AC power mains with a voltage exceeding 270V will cause significant damage to the device and create a serious risk for users!

8.3 CURRENT REQUIREMENT

The KL12ma presents a dynamic load to the AC mains, which causes the amount of current to fluctuate between quiet and loud operating levels. Since different cables and circuit breakers heat up at varying rates, it is essential to understand the types of current ratings and how they correspond to circuit breaker and cable specifications. The maximum continuous RMS current is the maximum RMS current in a period of at least ten seconds. It is used to calculate the temperature increase in cables, which is used to select cables that conform to electrical code standards. It is also used to select the cable size and gauge, and the rating for slow-reacting thermal breakers. The maximum burst RMS current is the maximum RMS current in a period of approximately one second. It is used to select the rating for magnetic breakers. The maximum instantaneous peak current during burst is used to select the rating for fast reacting magnetic breakers.

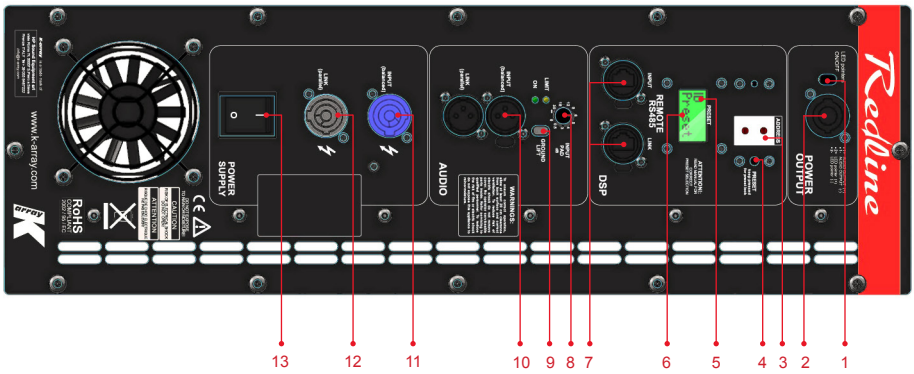
For best performance, the AC Cable voltage drop should not exceed 10% at 115V and 5% at 230V.

The minimum electrical service amperage required by a K-array loudspeakers system is the sum of their maximum continuous RMS current. We recommend allowing an additional 30% above the minimum amperage to prevent peak voltage drops at the service entry.

KL21ma max continuous apparent power (VA)

900VA(>10 sec) - 3500VA (<1 sec)

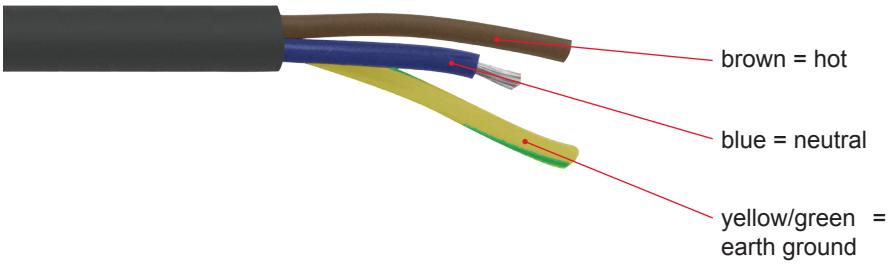
8.4 REAR PANEL



1. LED pointer ON/OFF
2. Speakon power output. To use with KR400 satellite or with KL21 passive subwoofer.
3. Address selector,
(rotary x10 - x1)
4. Preset selector,
press one to change, keep 10 sec. to store
5. ID number for remote control
6. Preset in use
7. RS485 connections for remote control (don-t connect to LAN port)
8. Input PAD level
9. Ground lift switch
10. Balanced XLR IN/OUT parallel
11. PowerCon Input
12. PowerCon parallel Output
(max 5A @110V)
13. Power switch

8.5 POWER CONNECTOR WIRING

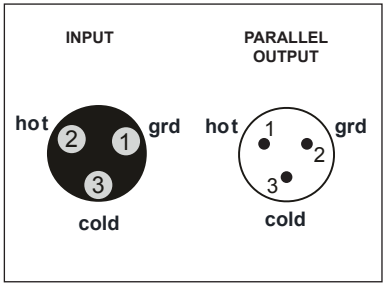
The KL21ma's amplifiers receive DC power from the 3-pin blue PowerCon connector on their back panel. The white PowerCon connector is a parallel OUTPUT for supplying power to other devices (max 5A @110V supported). When AC power is applied to the speaker, the auto-range power supply automatically selects the correct operating voltage.
To create your own power cables, please use the following wiring diagrams:



8.6 AUDIO INPUT CONNECTOR WIRING

The Audio section includes a female balanced XLR connector and a male XLR connector wired in parallel. Thanks to these connectors it is possible to feed a module and send the same signal to another one through the LINK connector. It is possible to connect up to 30 different modules in parallel on the same balanced line (with a source of 600 ohm output impedance). A Level Control potentiometer (PAD) allows different set levels. In order to create your own signal cables, please use the following wiring diagrams:

XLR connector



8.7 AMPLIFICATION AND PROTECTION CIRCUITRY

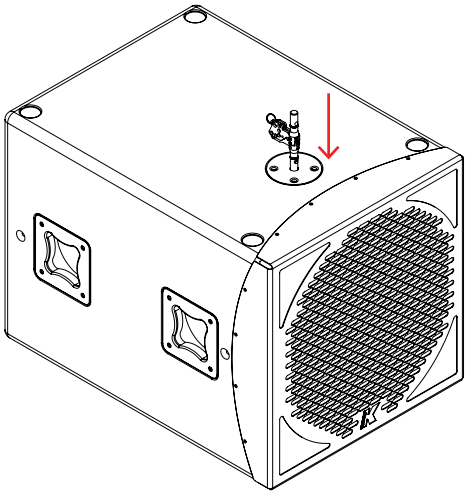
The KL21ma is powered by a 2-channel high power digital amplifier feeding the connected KR400 modules with a power output of 1800W in each channel.

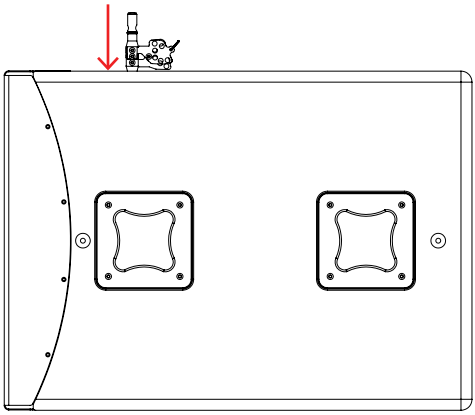
All the specific functions for the KL21ma, such as crossovers, frequency, phase response, and driver protection are determined by a DSP processor installed inside the amplifier.

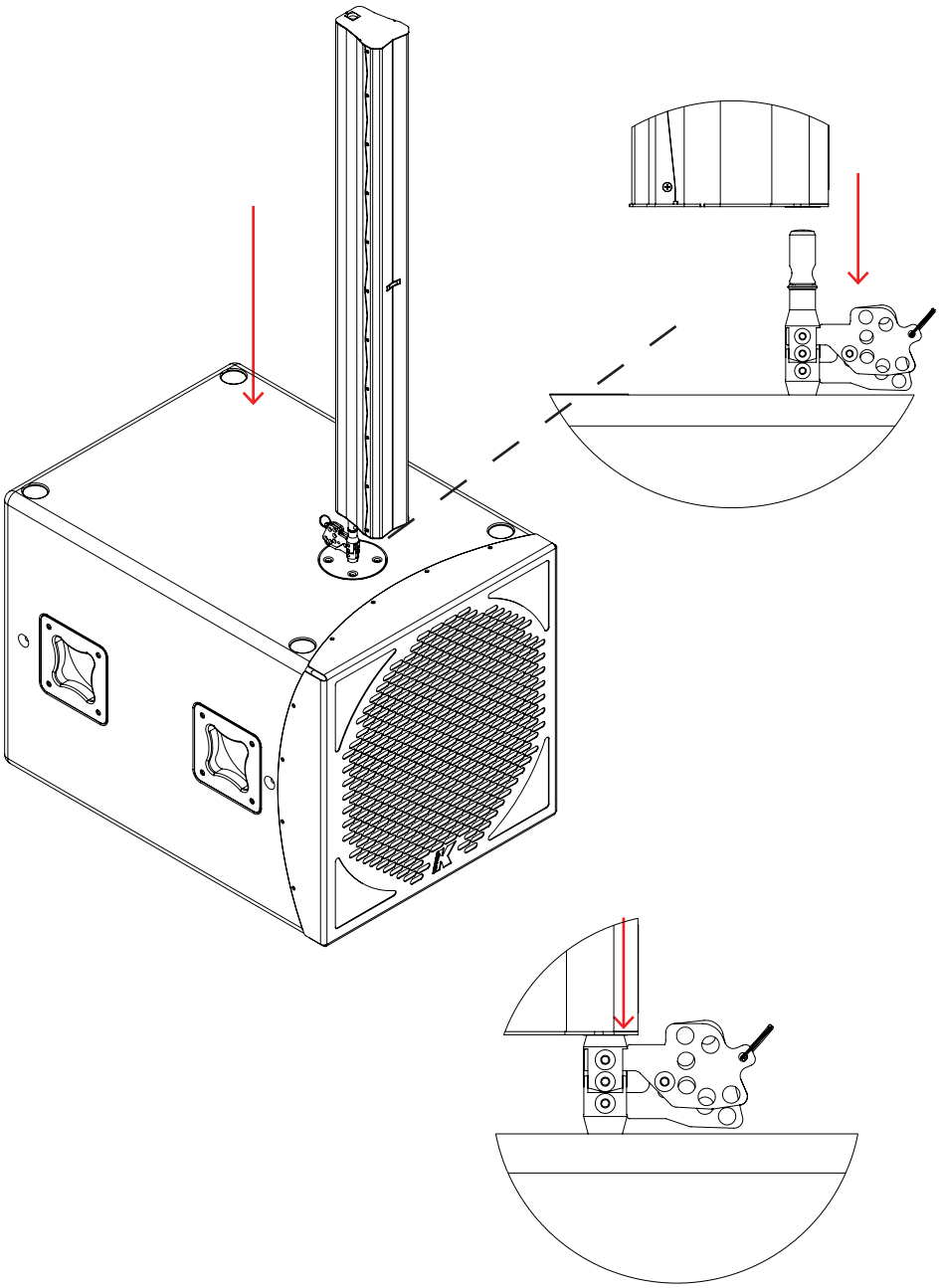
The devices have three different types of audio signal limiter. The Clip limiter, the Average Power limiter and the High Frequency limiter reduce the risk of damaging the components of the speakers.
A Peak Current Shut Down acts as output stage switching process inhibition that resets itself after 2 seconds. The tripping point is at 52A.

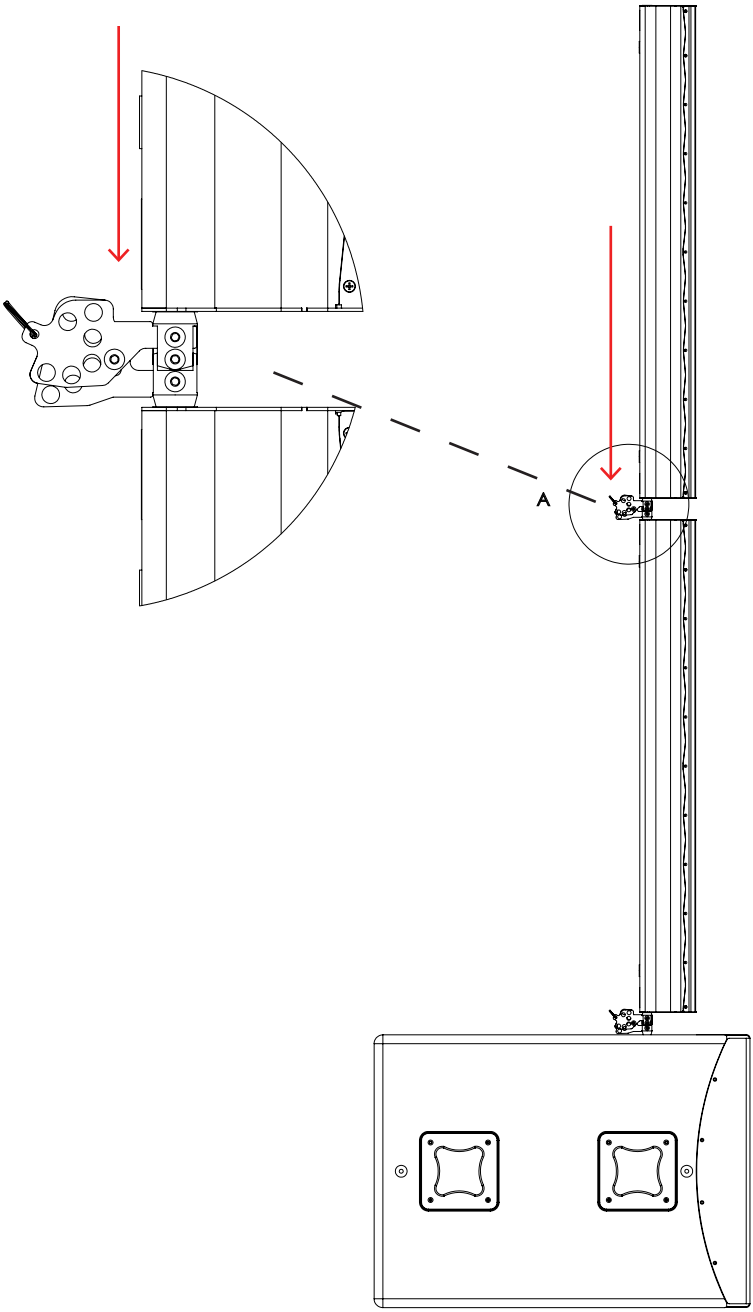
A temperature protection limiter ensures the output stage gain stays below a temperature of 85° (approximate temperature of output power device).

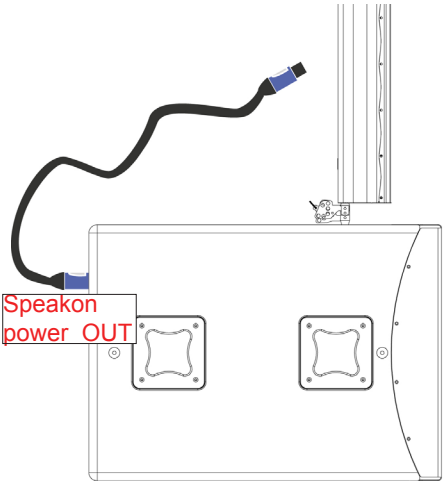
9. SYSTEM CONFIGURATION ON THE FLOOR

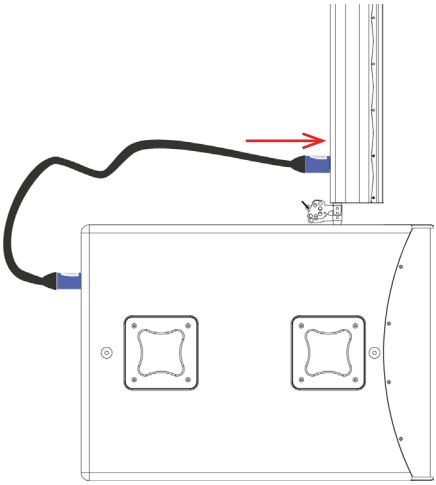


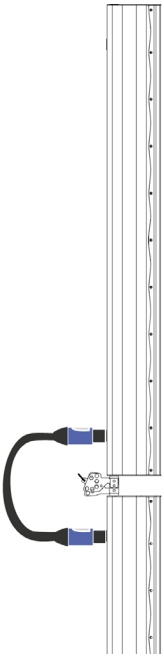


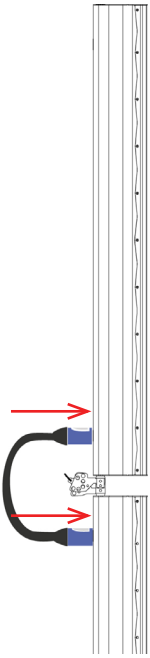



A


Speakon
power OUT

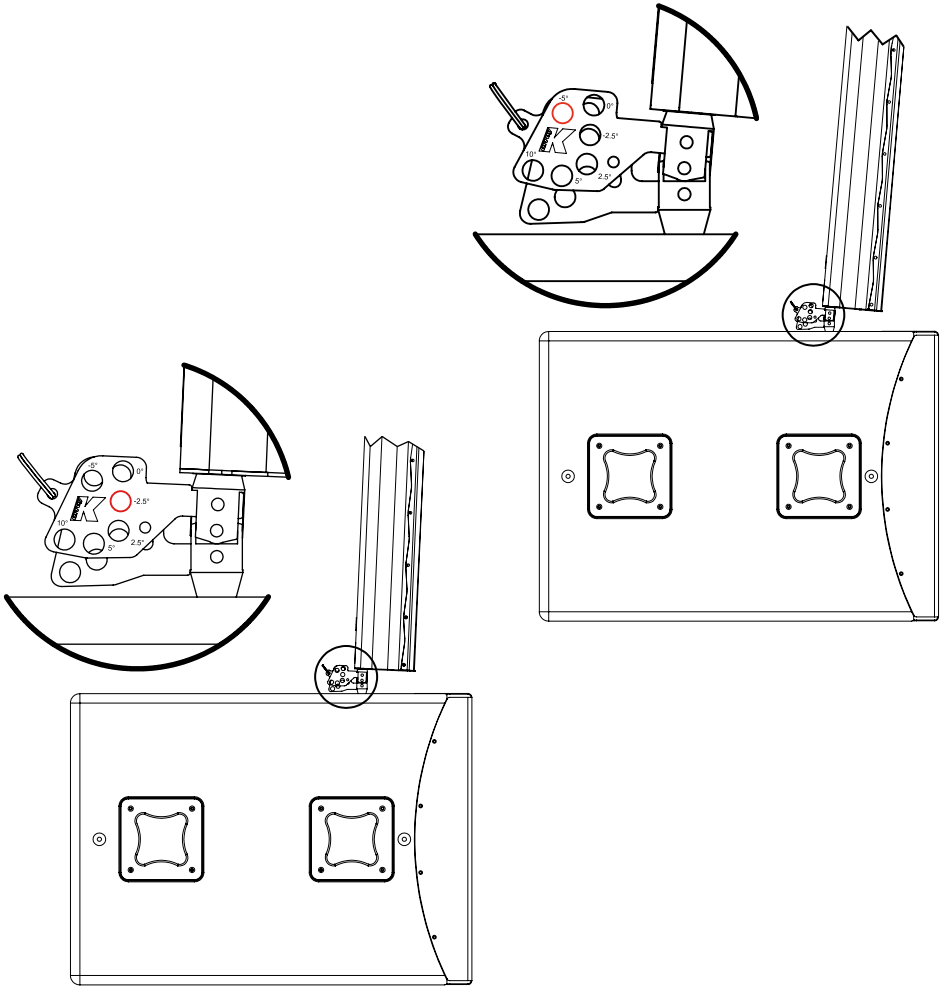


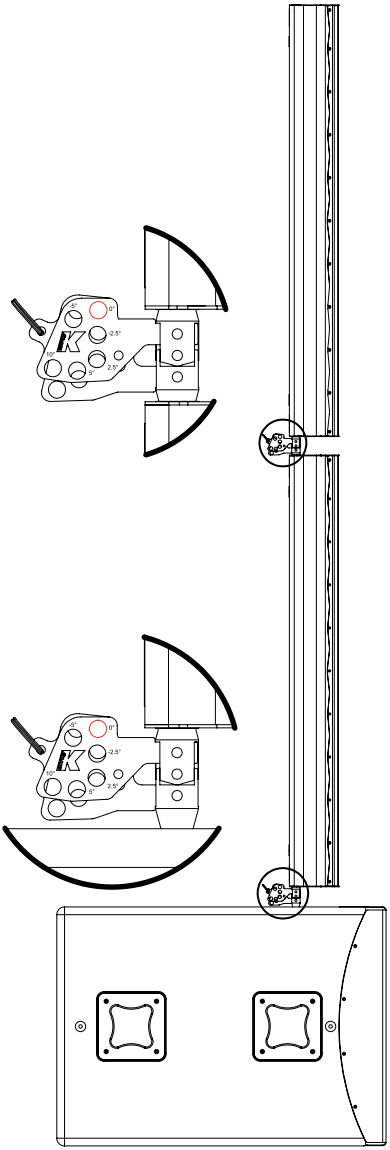


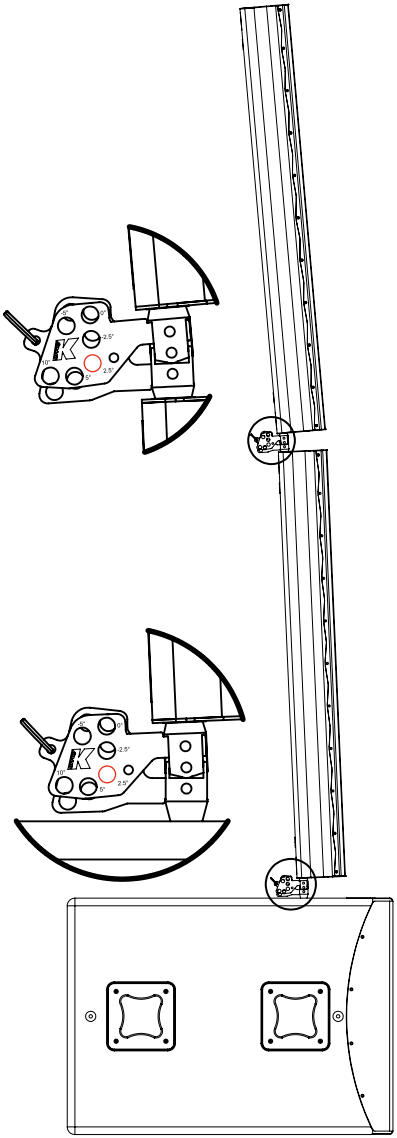


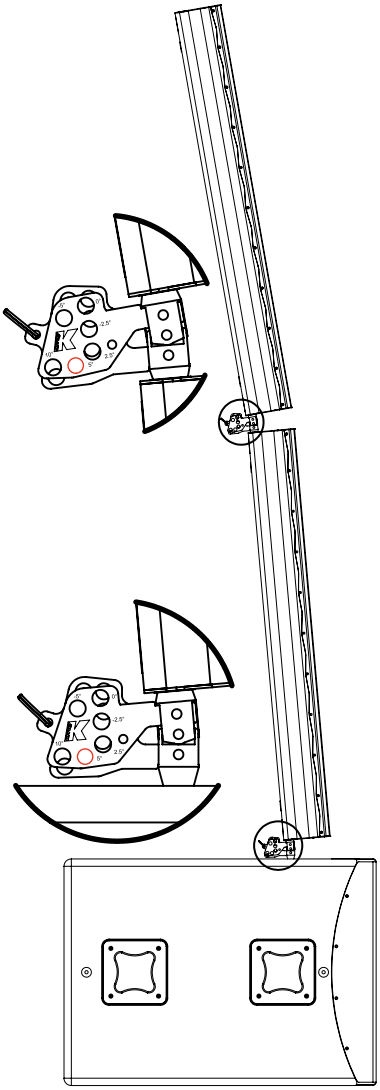
The included joints allow the user to tilt both the KR400 modules at different angles (positive and negative) in order to cover different audience areas.

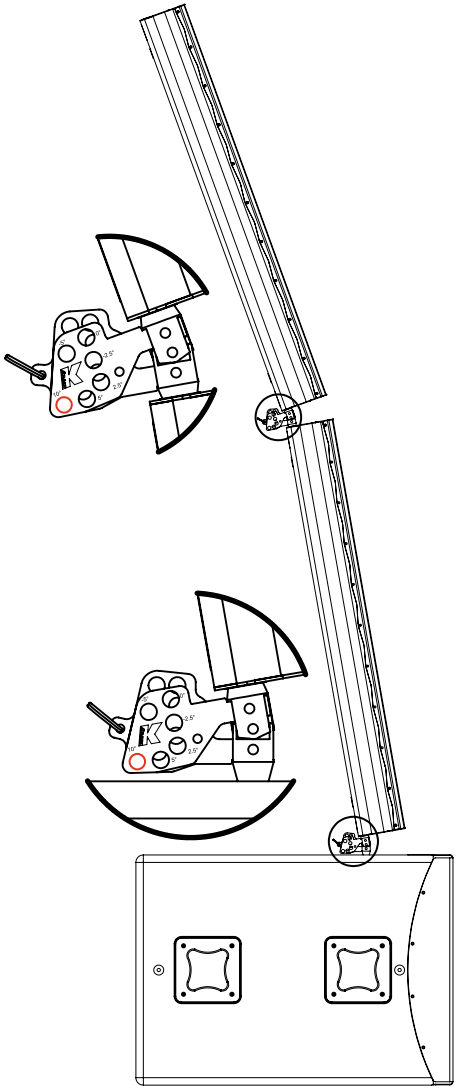
Some examples of typical configurations:

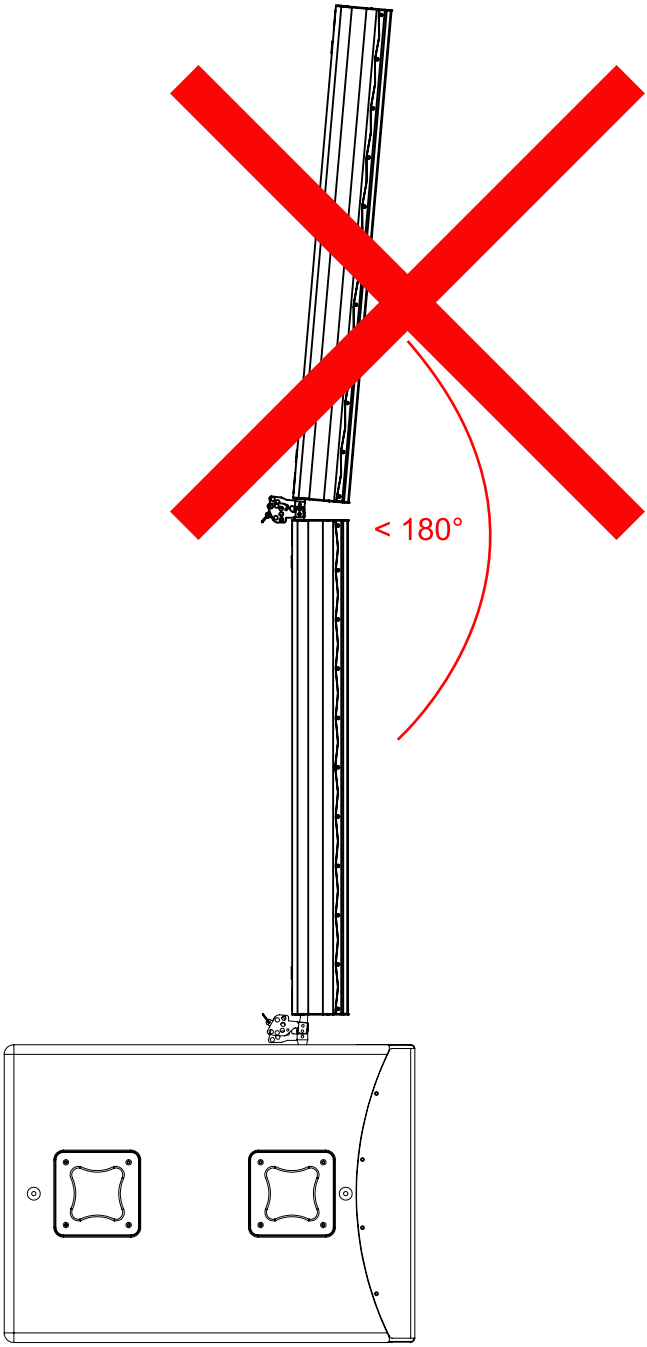




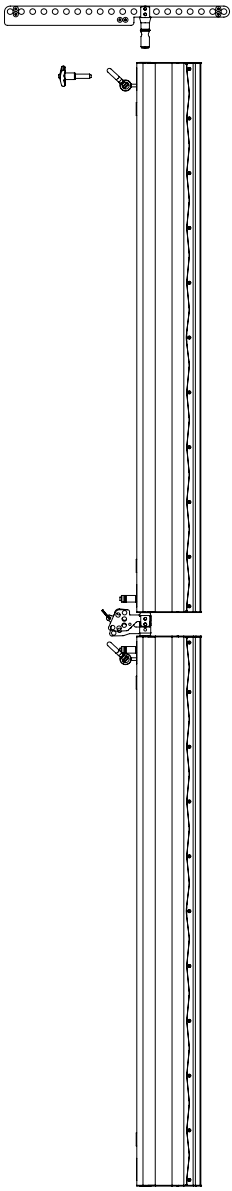


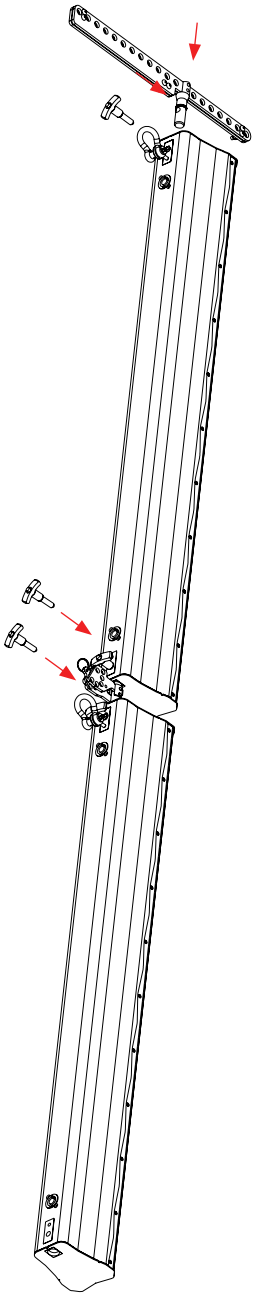


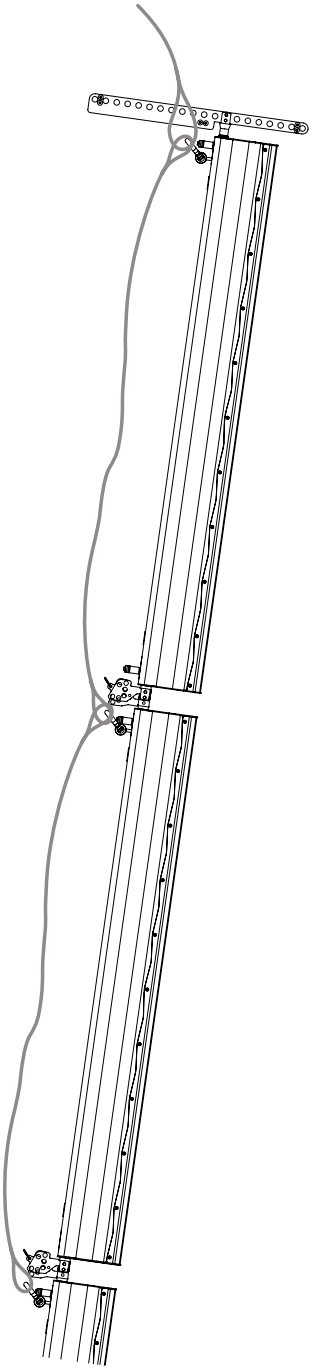


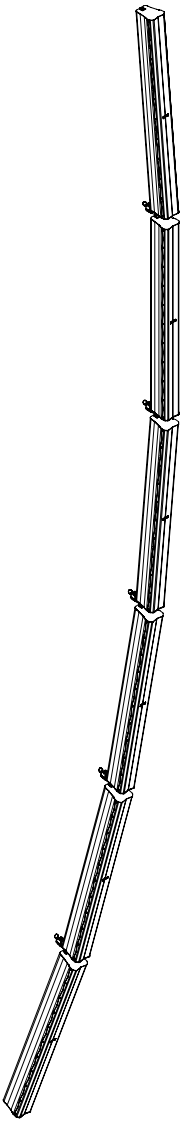

< 180°

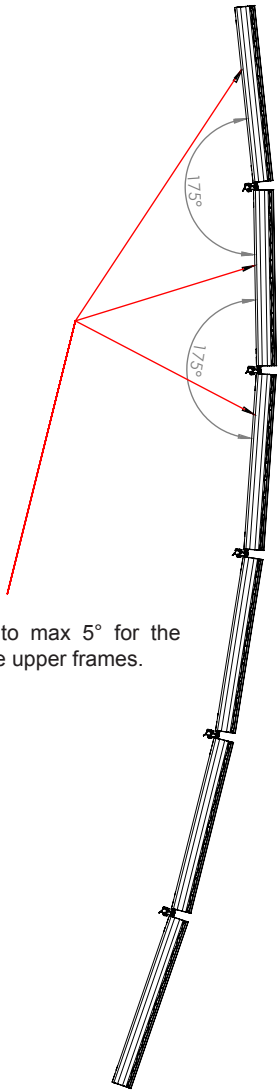
10. HANGING INSTALLATION INSTRUCTIONS









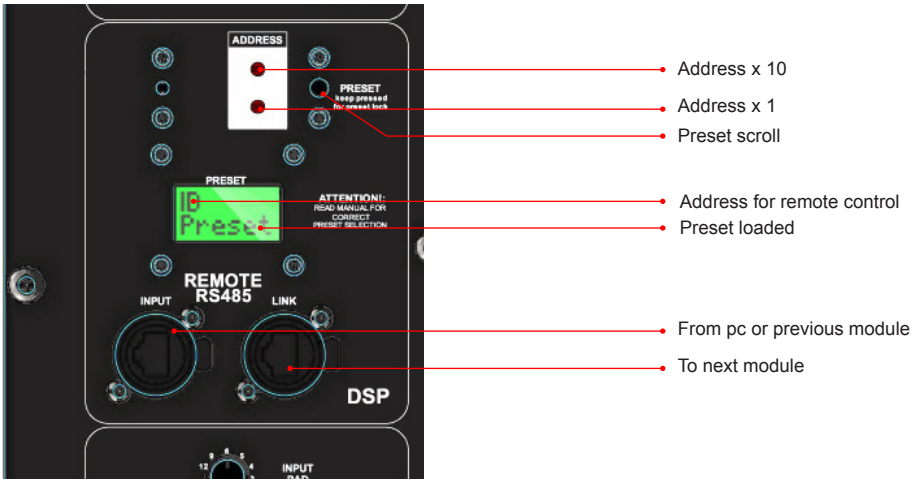


Set to max 5° for the three upper frames.

10. DSP CONTROL & REMOTE CONTROL

KL21ma has a powerful DSP that manages all the functions of the speakers. Each system can store 16 presets on board that can be recalled by pushing the PRESET button. Once the preset appears on the lower line of the display, it will automatically become available after a few seconds. If you desire to set a preset as “default”, you need only hold down the PRESET botton for 5 seconds. After that, the preset will automatically be recalled each time you switch on your module. It is also possible to set up remote control of each module from a computer through the RS485 serial port. In order to set up remote control of your system, you need to assign each module to a different address, so that in your chain no one module will have the same address. Two rotary encoders allow you to set the desired address number that will appear on the top line of the display. Using the remote control software it is possible to mute each system, select a desired preset stored on-board or download a new preset pack.

For remote control operation please refer to the REMOTE CONTROL AND SOFTWARE MANUAL in the following pages.



10.1 CLONER FUNCTION & PRESET SYSTEMS

It is possible to clone an entire presets bank from Speaker to Speaker without having a PC connected. We will image that Speaker A has the preset bank you want to clone, and Speaker B is the speaker you want to upgrade.

- Set Speaker A to ID 99. CLONER will appear on the display.
- Keep Speaker B on any ID number between 10 and 90.
- Turn off both speakers and connect them using a RJ45 8 poles cable.
- Turn on the Speaker B fist, followed by SpeakerA.
- Speaker A will start to clone. A countdown will appear on the display (00/15, 01/15, etc).
- Wait for 20 seconds after 15/15 appears on the display.
- Change the ID of Speaker A to any other ID and turn off both Speakers.
- When you turn on Speaker A check that it is in mode 16x16 and NOT 4x4.
- If Speaker A is in mode 4x4, just turn off the speaker and hold down the Preset button whilst turning it back on.
- The preset heve been cloned to Speaker B.

11. REMOTE CONTROL SOFTWARE

1 . To connect the K-array modules to a PC, a RS485-USB adapter is required, we recommend the K-USB adapter (pic.1).
Connect the K-USB to a PC and install the required drivers included in the CD-ROM.

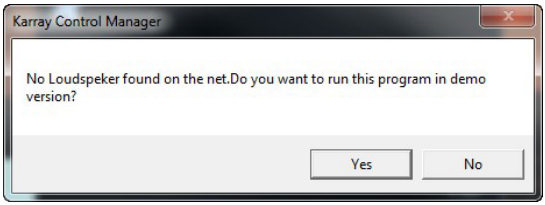
K-USB
USB to RS485 adapter

SYSTEM REQUIREMENTS
Operating systems:
Win98/98SE/Me/2000/XP/Vista
Minimum requirements:
CPU 300 MHz
RAM 128 Mb
Recommended requirements:
RAM 512Mb

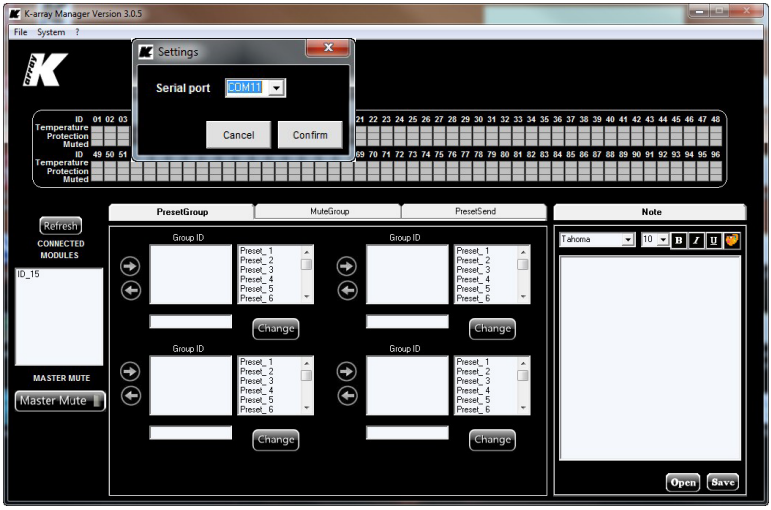
2. Install the K array control software from the CD-ROM installer.

2.1. Start the Karray_manager_V2 from Windows (Start -Software -Karray managerV2)

2.2.Click on NO when asked whenether you want to star in Demo Mode.



2.3.Click onSystem-Settings to configure which COM port use. The COM port of K-USB is usually the highest number. If you cannot find the port, you can look for it using Windows control panel - System - Hardware - COM Port



3 . IDsetting

Address x 10

Address x 1

Preset scroll

Address for remote control

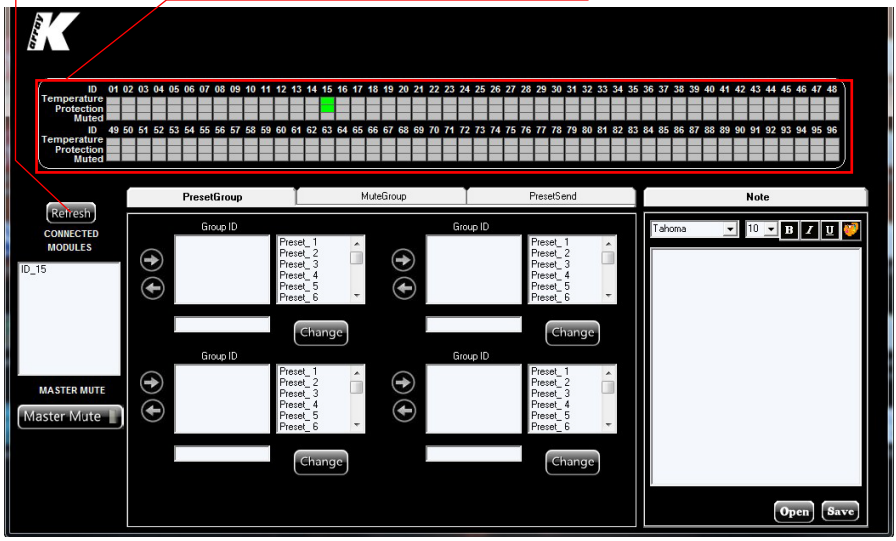
Preset loaded

From pc or previous module

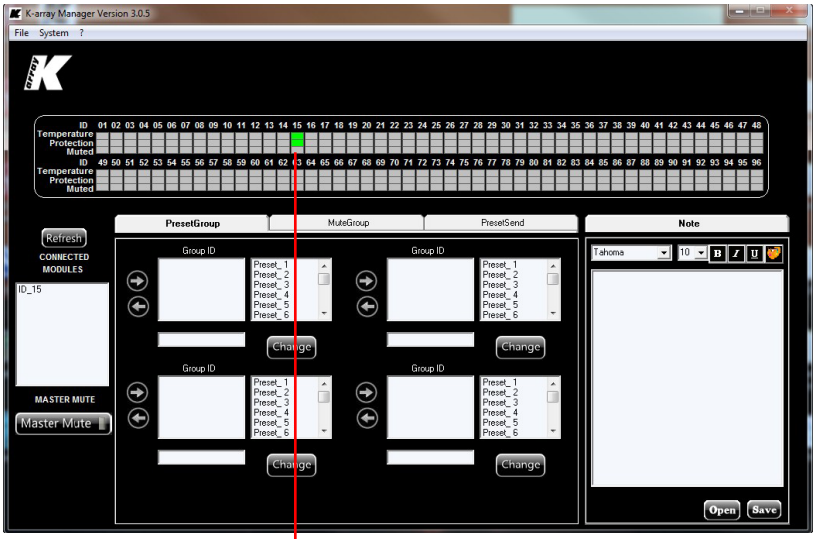
To next module

By pressing this button you can refresh the modules connected.

On these bars you can see all the modules connected to your chain.



4 .Single module control

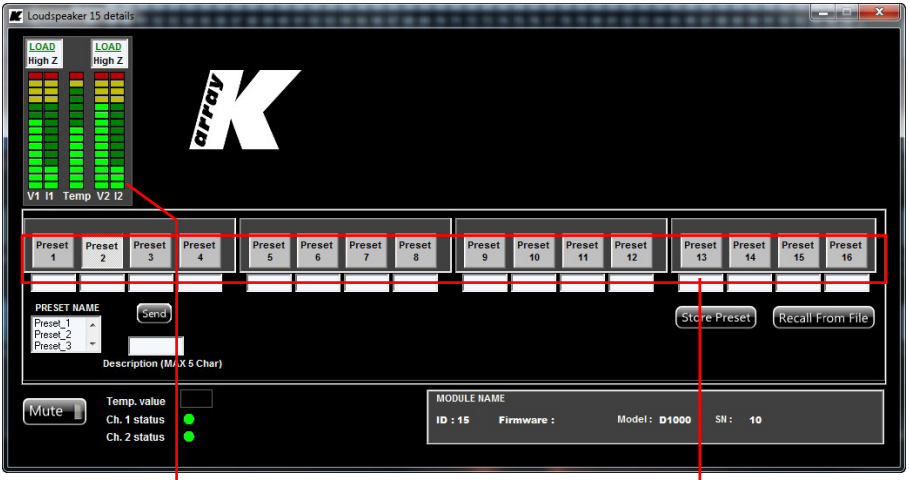


Click once on the ID module that you want to control.

This frame describes the state of all the loudspeakers on the chain.
The colour of the little rectangles in this frame represents the status of the loudspeakers. Each loudspeaker has three rectangles. The colours of the rectangles indicate the following:

The two upper rectangles

Both rectangles grey: the loudspeaker is not present on the net.
Temperature rectangle red: one module inside this loudspeaker is over-heated.
Temperature rectangle green: all modules inside this loudspeaker have a good temperature.
Protection/Fail rectangle red: at least one module inside this loudspeaker is in protection.
Temperature rectangle green: all modules inside this loudspeaker are working properly.
Temperature rectangle black: if this rectangle is black it means that the loudspeaker is not responding.
The main causes of this malfunction are loss of power supply and loss of serial connection between the hub and the loudspeaker. Check the hardware. If this rectangle is black the Protection/Fail rectangle will also be black.
Protection/Fail rectangle black: see above.
The remaining rectangle: This is related to the mute function; if red, the related loudspeaker is in “mute” status.

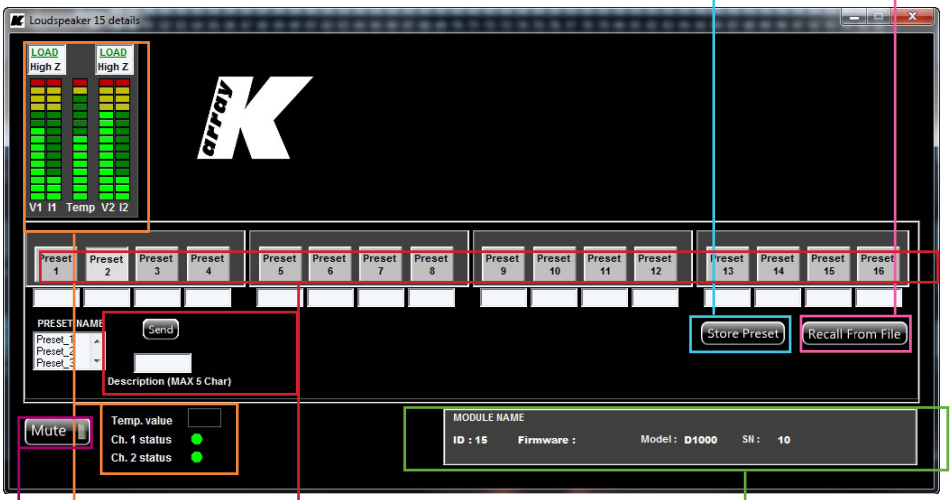


Module status panel

Preset slots on the module

With this button, you can load presets from the PC to the module. Click on this button, choose the slot that you want use and select the EQS file that you want to load.

Store the active preset as default when the module is restarted.



Module status panel

Mute Module

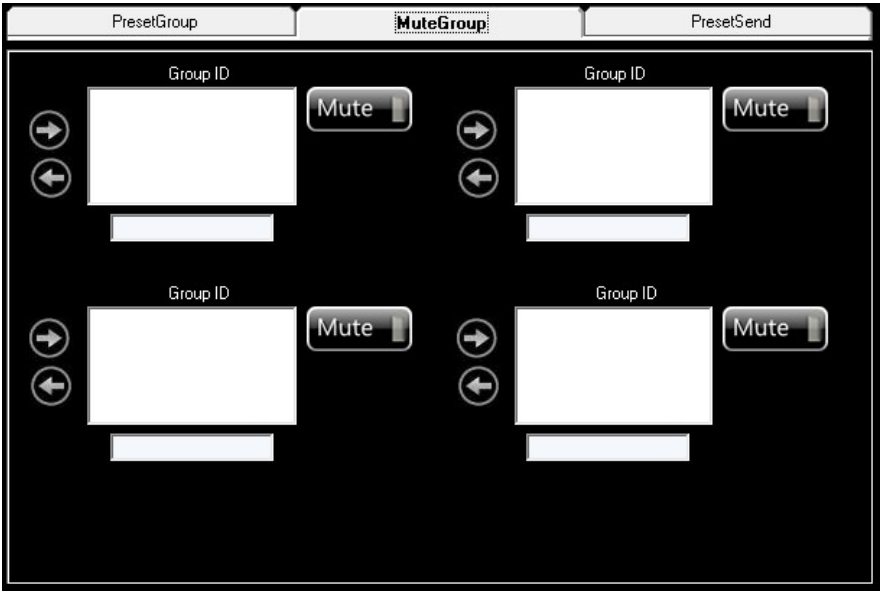
Select the preset number, write the name, maximum 5 characters, press the Send button

Module details

5.Mute groups

On the Mute Groups window, you can mute the modules as groups. You can have up to 4 different groups.

5.1.Choose the modules from the list on the right and press the right arrow button next to the group that you wish to use to add the modules.

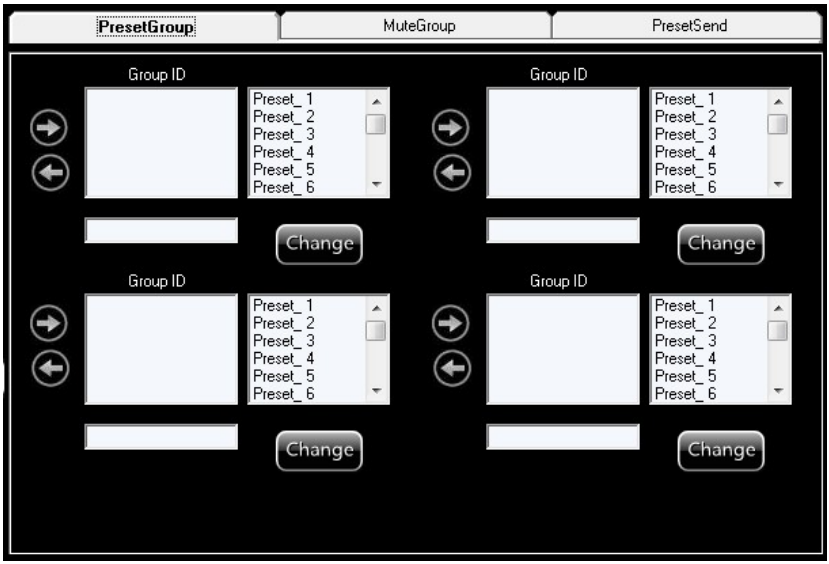


5.2. It is possible to assign names to the groups, by simply writing in the fields.

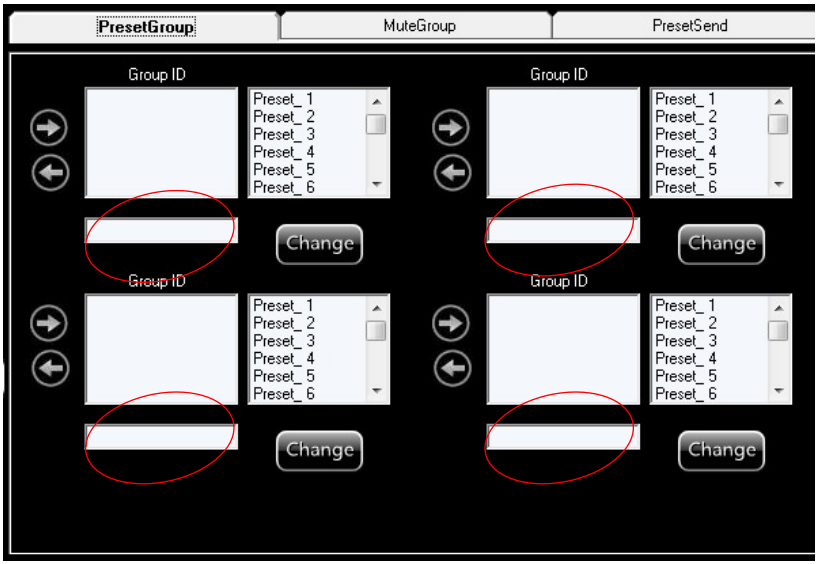
6. Preset groups

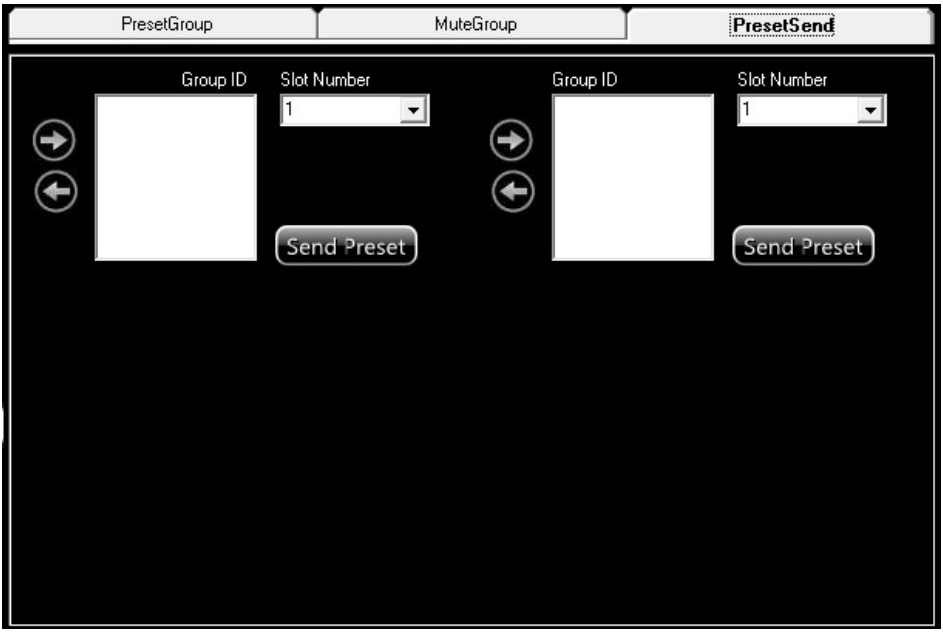
On the Preset Groups window, you can manage the modules Presets as groups. You can have up to 4 different groups.

6.1.Choose the modules from the list on the right and press the right arrow button next to the group that you wish to use to add the modules. Select the number of the preset you want to choose and then press Change button.



6.2. It is possible to assign names to the groups, by simply writing in the fields.





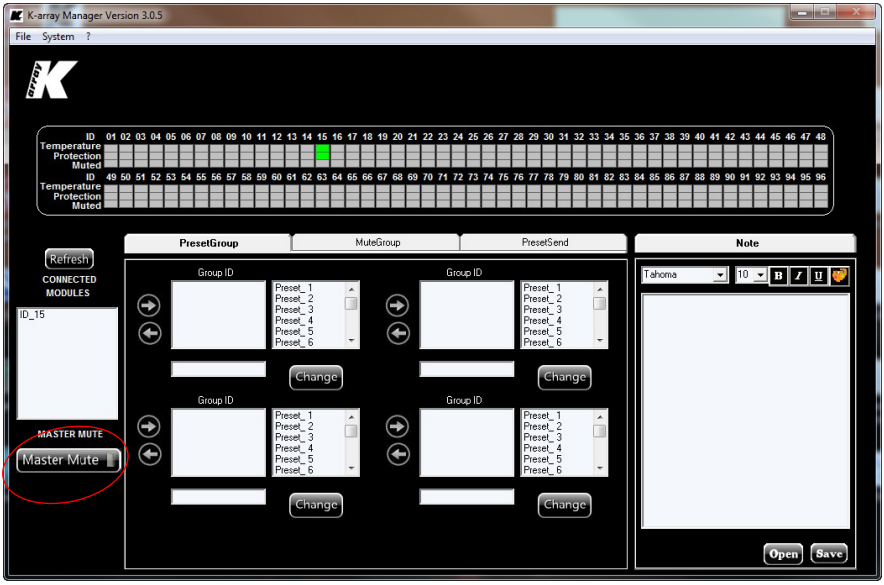
6.3. From the Preset Send window you can load a preset on the same slot of multiple devices.

7. Text editor

It is available a text editor on the software, it can manage .RTF files.

8.Master Mute control

It is possible to Mute all the modules connected by pressing the Master Mute button. The button is locked to prevent it from being accidentally. You will need to Unlock it by pressing the Unlock button below it.



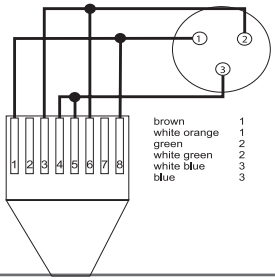
9.Exit option

When you choose to exit the software, an alert window will appear that reminds you to Unmute all the connected modules. This is important because the Mute function can only be controlled by the software.

10.Save and Load

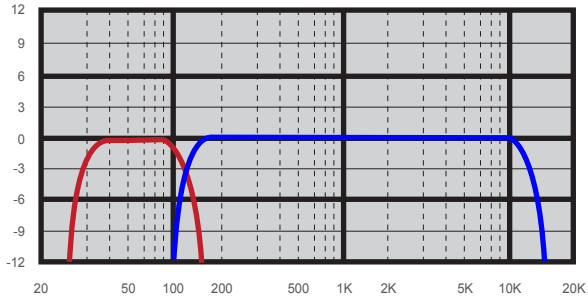
It is possible to save the speaker configuration for Mute and Preset Groups. Just save as a .CONF file.

It is possible to use XLR adapters for connections. The connection schematic is shown here on the right.

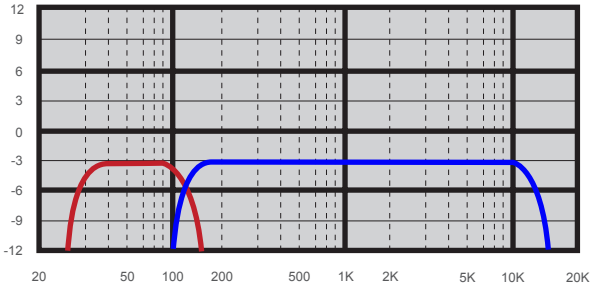


12. PRESETS DIAGRAMS

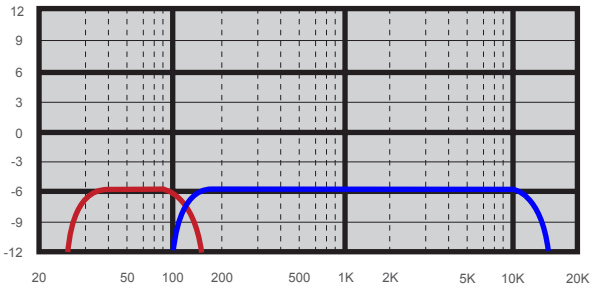
eaClear



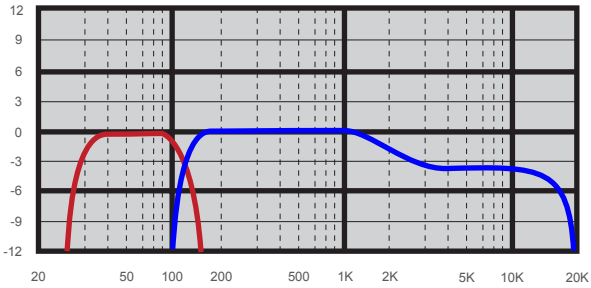
eaC-3



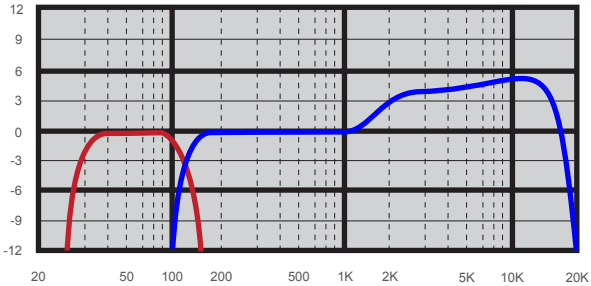
eaC-6



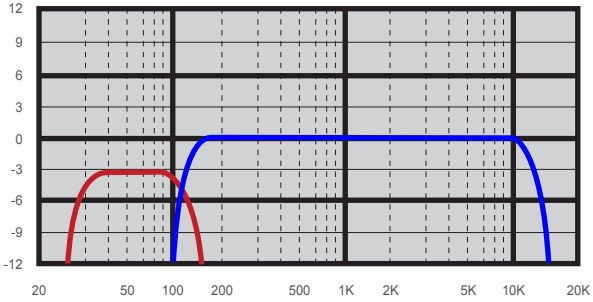
eaC-3Hi



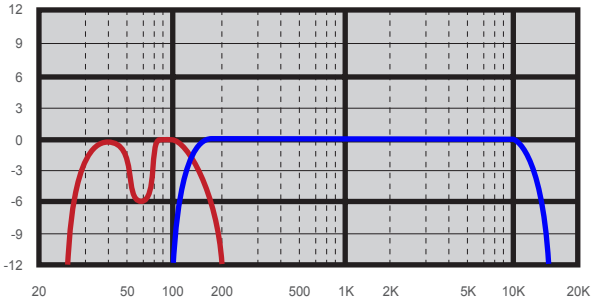
eaC+3Hi



eaC-3Lo



eaC-6Sub



13. SERVICE

To obtain service:
1) Contact the official K-array distributor in your country. They will direct you to the service centre.
2) If you are calling for service, have the serial number(s) of the unit(s) to hand for reference. Ask for Customer Service, and be prepared to describe the problem clearly and completely.
3) If the problem cannot be resolved over the phone, you must return the unit for service.
4) You will be given an RA (Return Authorization) number for job tracking. Refer to this number on shipping materials and in all correspondence concerning the repair. Shipping charges are the responsibility of the purchaser.

Any attempt to modify or replace components of the device will invalidate your warranty. Service must be performed by an authorized K-array service center.

Cleaning:
Clean the product enclosures using a soft, dry cloth only. Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives. Do not use any sprays near the product or allow liquids to spill into any openings.

14. KR400s TECHNICAL DETAILS

	KR400S
	Acoustics
Power handling	1500(sub) + 2 x 720(sat) w(EAS)
Maximum amplifier power	2500(sub) + 2 x 1200(sat) w(EIAJ)
Impedance	4Ω(sub)+6Ω(sat)
Operating frequency range	30Hz - 19 KHz +/- 3dB (preset dependent)
Maximum SPL	132dB continuous - 138 dB peak
	Coverage
Horizontal	90°
Vertical	mechanically variable 6°-20°
	Cross over
Type	DSP controlled
Frequency	80 Hz minimum (preset dependent)
	Transducers
Low frequency	21" Neodymium speakers with 3" voice coil
High frequency	2 x 12 x 3" Neodymium speakers with 1" voice coil
	Audio Input
Connectors	male + female parallel 3 poles balanced XLR
Wiring	Pin1 = ground - Pin2 = hot - Pin3 = cold
	Audio powered Output
Connector	Female Speakon
Wiring	Pin1+=CH1+ Pin1=CH1- Pin2+=Pointer + Pin2=Pointer -
	Remote control Input
Connectors	2 x female 8 poles RJ45
	Power Input
Connectors	2 x PowerCon IN/OUT
	Amplifiers
Type	1 modules class D - DSP controlled
Subwoofer power	1800 Watt
Satellite power output	1800 Watt
Protection	Dynamic limiter, over current, over temp, short circuits
	AC power
Operating range	85 - 270 Vac 50-60Hz (Autorange)
P. nom	900 Vac
Max operation voltage	400 Vac
Min operation voltage	70 Vac
	Physical
Dimensions	KL21ma: 55.5 x 55.5 x 77.7 cm (21.85"x 21.85" x 30.59 ")KR400 (2 pcs): 8.8 x 100.5 x 11.5 cm (3.56" x 39.57" x 4.53")
Weight	KL21ma: 39 Kg (85.98 lbs) 2x KR400: 2x 9 Kg (2x 19.84 lbs)

Notes for data

1. Amplifier wattage rating is based on the maximum unclipped burst sine wave RMS voltage that the amplifier will produce into the nominal load impedance.

New materials and design are introduced into existing products without previous notice. Present systems may differ in some respects from those presented in this brochure.

APPROVAL

K-array declares that this device is in compliance with the applicable CE standards and regulations. Before putting the device into operation, please observe the respective country-specific regulations!

WEEE

Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling centre for such equipment.

The contents of this manual are furnished for informational purposes only. Hp Sound Equipment s.r.l. assumes no responsibility for any errors or inaccuracies that may appear in this manual. Hp Sound Equipment s.r.l. reserves the right to make modifications without prior notice.

k-array is a brand of
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